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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 10, 1945

Light for the Future

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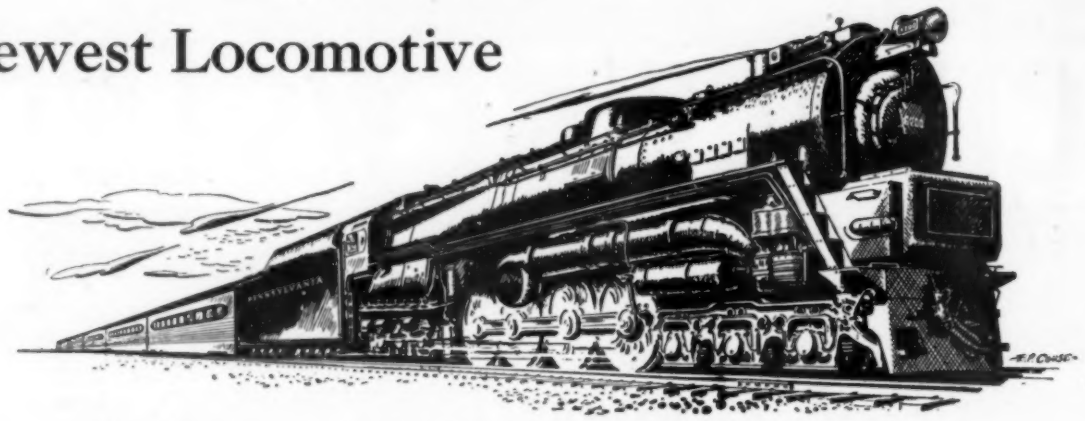
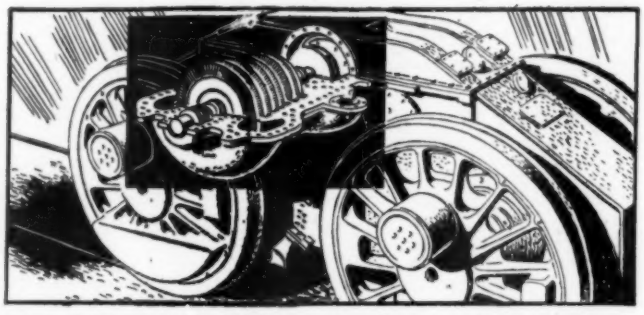
A SCIENCE SERVICE PUBLICATION

This Newest Locomotive

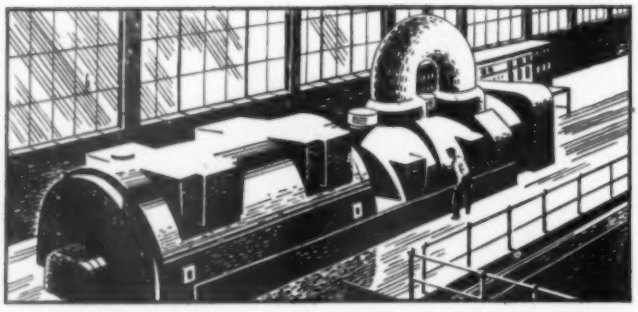


is Powered Like a Battleship

LONG AGO successfully developed by Westinghouse for ocean vessels, the *steam turbine* has now been harnessed as a brand new type of smooth, efficient motive power for modern railroad locomotives.



THE WESTINGHOUSE steam turbine in the Pennsylvania Railroad's new direct-drive locomotive is *no bigger* than a household electric refrigerator—yet it will haul long passenger trains with ease.



THE POWER-PACKED locomotive turbine is a descendant of giant Westinghouse turbines which generate much of the electricity used today. The great expansion of electric power began with these turbines.

THE VELVETY FLOW of power from this 6,900 horsepower *steam turbine* locomotive will make trains run with extra smoothness and is a major contribution to finer transportation for the future.

THE RAILROADS are developing a dazzling new kind of transportation for the future. The latest and most dramatic improvement is *steam turbine* power, which gives the Iron Horse "new lungs."

To help produce this new locomotive, the Pennsylvania Railroad, a long-time pioneer in transportation improvements, turned to Westinghouse and the Baldwin Locomotive Works. Working as a team, these companies have produced this latest in a great line of steam locomotives—descended from "Old Ironsides," built by Matthias Baldwin in 1832. *Westinghouse Electric & Manufacturing Company, Pittsburgh 30, Pennsylvania.*

Westinghouse
PLANTS IN 25 CITIES OFFICES EVERYWHERE

Westinghouse presents:* JOHN CHARLES THOMAS—*Sunday 2:30 pm, EWT, NBC

MEDICINE

'Flu Viruses Alike

Grown on two widely different kinds of living tissue, chick embryos and mouse lungs, they have been shown chemically and physically identical.

▶ INFLUENZA viruses grown on two widely different kinds of living tissue, chick embryo and mouse lung, respectively, have been shown chemically and physically identical in experiments conducted at the Rockefeller Institute for Medical Research, by Dr. C. A. Knight. This evidence of identity, obtained for the first time on viruses that prey on animal hosts, has considerable practical value from the medical standpoint, for it gives reassurance that vaccines for human diseases cultured on media of non-human origin can be left essentially unchanged by possible influences of their alien hosts, and still have disease-preventing value when re-introduced into the human system.

The virus used by Dr. Knight in his crucial experiments is a strain of human influenza listed as PR8, because it is one of a series that was isolated during an epidemic in Puerto Rico. It has been kept going in the laboratory, for research purposes.

Dr. Knight first planted the virus in incubating hens' eggs—a procedure that has now become standard in propagating various causal agents of disease. He separated out a purified fluid containing the active principle, and accumulated a considerable quantity of it. He also cultured the same virus in the lungs of laboratory mice, and after painlessly killing the animals extracted and purified the fluid from that source.

Careful laboratory comparisons by both chemical and physical means indicated that the viruses collected from these two widely diverse sources are alike in all essential respects. The mouse-lung strain, when cultured on chick embryos, apparently behaves exactly as does the strain that has been fed on chick embryo all the time. Finally, examination with the electron microscope shows the spherical particles that appear to be the "bodies" of the virus to be identical in appearance.

Chemical and physical identity between strains of tobacco mosaic, a plant-disease virus, was demonstrated in the Rockefeller Institute laboratories some years ago by Dr. W. M. Stanley, but until now a parallel proof in the case of an animal virus has not been possible.

Dr. Knight gives a condensed summary of the technical details of his work in *Science,* (Mar. 2), and states that a longer discussion will soon be published elsewhere.

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MOURNING CLOAK—This butterfly has the unusual habit of hibernating during the cold winter months. Its favorite sleeping location in cold weather is under the loose bark of a tree. The first warm days in March usually bring him out into the sunshine. Photograph by George A. Smith.

AERONAUTICS

Fastest Fighter

Known as the "Shooting Star," the P-80 gives the Allies supremacy in the field of jet-propelled aircraft, Gen. Arnold discloses.

▶ THE ALLIES hold supremacy in the field of jet-propelled aircraft, reports Gen. H. H. Arnold, commanding general of the U. S. Army Air Forces, in disclosing first facts about the P-80, the fastest fighter in the skies.

The P-80, built by Lockheed, and developed with the aid of the Air Technical Service Command at Wright Field and British engineers, is known as the "Shooting Star." The P-80 can fly as far as any of the conventional pursuit ships in use today. This solves one of the major problems of design in jet-propelled airplanes.

Powerful armament is located in the nose, for the most effective concentration of fire power. The airplane is powered by General Electric's turbo-jet engine installed in the tail of the sleek plane. This engine of simple design produces more than twice the power of earlier models built for the AAF.

Air for the jet engine in the Shooting Star rams into vents in front of the wings, almost flush against the fuselage. It pours through the vents into the engine, where it is compressed by a swiftly turning impeller. At very high altitudes the air will be as cold as 75 degrees below zero Fahrenheit. The air is whipped by the impeller to a combustion chamber, where the aviation kerosene burns furiously. This causes the air to expand as a hot gas and increases its velocity. The gases then pass through a red-hot turbine wheel, which is connected by a shaft to the impeller-compressor. Finally, the blast passes out through the jet exhaust at the rear tip of the plane, giving tremendous forward thrust.

The improved jet motor on the P-80 makes virtually no vibration. This reduces the fatigue on the pilot. Although the pilot hears no noise from the jet while in flight, a rumbling roar, like a baby thunder, passes out the rear. Another advantage of the new jet motor is that it requires no warm-up. It develops more than enough power for a take-off in less than a minute.

The P-80 has a new type of wing with a knife-like leading edge and other aerodynamic innovations that master the problems encountered when the speed of sound is approached or surpassed. The cockpit is located forward of the wing, and the pilot gets fine visibility through a plastic bubble canopy. The cockpit is pressurized so that the pilot can fly above 30,000 feet without use of an oxygen mask. The Shooting Star is also equipped

for anti-G suits, which help prevent a blackout of vision during sharp turns and pullouts.

Small and lightweight, the new plane is extremely maneuverable through use of a hydraulic aileron boost and electrically operated flaps. It can carry heavy loads of ammunition, bombs and fuel, as well as photographic equipment for aerial reconnaissance. The simplicity of its design eliminates most of the controls found in a conventional reciprocating-engine airplane.

The entire surface area of the new jet plane is lacquered to a high polish. This reduces the air resistance still further and gives it the appearance of a skyrocket of death cutting through the skies.

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AERONAUTICS

Many Uses for Helicopters

When perfected, they may aid power and oil line inspectors, aerial photographers, and find other industrial and governmental activities.

➤ WHEN the helicopter is ready for the public it will find many uses in industry and government, as well as in civilian activities, Charles I. Stanton, Deputy Administrator of the Civil Aeronautics Administration, stated in an address before the American Helicopter Society in Bridgeport, Conn. He declared that the CAA is encouraging and fostering civil aviation and in this respect it is not ignoring the helicopter.

He pointed out that the helicopter may perform many industrial jobs already planned for fixed-wing airplanes, and in many cases it will do them better. Certain types of photography, particularly low-level shots of single buildings, can be done best from a stationary vehicle in the air, he said.

"Dusting of small areas such as stagnant pools, small fields surrounded by high obstructions and other pocket-like areas falls automatically into the performance ability of the helicopter," Mr. Stanton commented.

Aerial inspection of power lines and oil lines, and the transportation of repairmen to the scene of damage can be accomplished by the helicopter, he suggested.

As still further illustration of the versatility of the "flying windmill," Mr. Stanton stated that in the widespread range country of our western states, the helicopter may be used to spot cattle on the range, locate lost herds, and take censuses of wild animals. It can also be used in hunting coyotes.

Lakes so deep in the forests that they are still unknown to the fisherman's rod can become the long-sought vacation spots of sportsmen who own helicopters. In the duties of national conservation, the helicopter can be used as a flying sentinel over our national forests. It can help extinguish forest fires by permitting firefighters to drop bombs filled with fire-smothering chemicals into the heart of the flames.

"Everyone from the Greyhound Bus Company to the owners of a single taxicab decided that the helicopter was the answer to their plan for the future," Mr. Stanton remarked in speaking of the possible uses of the craft for feeder line service.

He declared that he did not know how soon the problems confronting helicopter engineers could be solved.

"We realize that although the helicopter has gained tremendous impetus from the demands of war, it is also being retarded in certain directions, because of military expediency. We know that the present models are not for the inexperienced private pilot; and we know that they demand too much expert maintenance for general utility," Mr. Stanton explained.

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MEDICINE

More Medical Societies Cancel Annual Meetings

➤ AMERICA'S oldest medical society, the American Psychiatric Association, and many medical societies younger than this 101-year-old organization, are cancelling annual meetings scheduled for this year, the action being taken in cooperation with the war effort.

The American Orthopsychiatric Association, the Society of American Bacteriologists, the Federation of American Societies for Experimental Biology which is made up of six scientific societies, and the American Public Health Association are the most recent to announce annual meeting cancellations.

Members of these societies have all been contributing to the war effort both through fundamental research leading to advances in medical treatment and through application of these advances for the protection and healing of our fighting forces.

The American Psychiatric Association has held meetings every year since 1844 except in 1861, when it was recorded "no meeting held on account of the disturbing conditions of the country." The Federation has cancelled its meetings each year during this war since 1942.

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MEDICINE

Mass Epidemics

Almost all troops based in the Pacific in the early phases of the war suffered from one or more diseases, it is disclosed by recent report.

▶ ALMOST all troops based in the Pacific in the early phases of the war suffered from one or more epidemic diseases, Comdr. James J. Sapero and Lieut. Comdr. Fred A. Butler of the Navy Medical Corps report, (*Journal, American Medical Association,* March 3).

"A series of outbreaks of tropical diseases in epidemic proportions of a magnitude and potential threat seldom if ever exceeded in American military history" is how they describe what happened as our forces began occupation of numerous islands to stem the Japanese 1942 advance.

From the lessons learned in this phase of the war, however, the epidemic diseases were soon brought under control.

"History," the two Naval medical officers believe, "will in time show that Allied success in disease control so greatly exceeded that of the Japanese that a major advantage in the war was thereby gained."

The most significant diseases which plagued the troops in New Caledonia, the New Hebrides, the Solomons, the Fiji Islands, and the Ellice, Samoan and Tonga Island groups were, in order of importance, malaria, dysenteries, dengue, Bancroft's filariasis, scrub typhus and infectious hepatitis. Bancroft's filariasis appeared in epidemic form in troops for the first time in history.

Military expediency and in some cases ignorance of methods of controlling these diseases were chiefly responsible for the early epidemics, it appears.

The initial occupation had to be made with such speed that there was no time for carefully considered plans of disease control. Also, the entire effort of the newly occupying force had to be turned toward even more urgent matters such as getting food and ammunition and digging in to fight the enemy.

Even though the newly occupied islands were known to be centers of "an impressive array of threatening diseases," many of them presented problems of control with which most medical officers were totally unfamiliar. In some cases the mechanics of how the diseases spread was not known to medical science.

One "small heroic group," for example, went into a region they did not even know was malarious. They had no entomologist with them to point out the breeding habits of the particular mosquitoes that spread malaria in that region. They put on a gigantic program of quartering, raking and burning coconut half shells and swamp draining, only to learn later that the particular malaria mosquitoes of the region did not breed in the swamp, seldom if ever bred in coconut half shells and actually were breeding in a small, harmless-looking stream.

The filariasis epidemic was totally unexpected. During the 40 years in which a naval station had existed at American Samoa, not a single case of this disease, with the dreaded end result, elephantiasis, had been reported in naval personnel. Subsequent discovery that the chief mosquito carrier of this disease would be found only within short distances of native villages which were the source of the infection showed the way to control this threat. In the early days of the war, however, troops were sent to some of the islands in such numbers that it was impossible to quarter them at safe distances from the natives and there was not always time for adequate mosquito control measures.

Unlike malaria and dengue, little progress has been made in preventing or controlling dysentery which plagued troops initially on every landing, the Naval officers report. Flies seemed to be the chief trouble-makers but usually before anti-fly measures could be taken, the epidemic had done its damage.

Amebic dysentery did not appear in epidemic form but how many low-grade chronic infections will appear in the future is "a matter for speculation."

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HYDRAULIC HOIST—This is the method used in a helicopter air-sea rescue system. It consists of a pump and motor each about the size of a man's hand—which was found capable of lifting and controlling a 400-pound load at two and one-half feet a second. Official U. S. Coast Guard photograph.

DENTISTRY

Immunity to Tooth Decay May Come From Ammonia

▶ IMMUNITY to tooth decay, or caries, comes from tiny amounts of ammonia continuously present in the mouth, it is suggested by findings reported by Dr. Robert G. Kesel, Joseph F. O'Donnell and Ernst R. Kirch, of the University of Illinois Colleges of Dentistry and Pharmacy in Chicago, (*Science,* Mar. 2).

The ammonia is present specifically in the patch of material on the tooth surface which acts as lodging for bacteria, known as the bacterial plaque. The ammonia comes from a small group of amino acids, protein building blocks, which are in the mouth as a result of the type of diet and body metabolism, the scientists report.

The lucky persons who are immune to caries have in their salivas enzymes capable of producing ammonia from certain amino acids, according to the findings of the Illinois group. Many enzyme systems were also found in salivas from persons with actively decaying teeth, but in most instances these salivas did not have an enzyme system capable of converting glutamic acid to ammonia.

The presence of ammonia in saliva was reported some years ago by another group of scientists, Drs. C. T. Grove and C. J. Grove. Its significance, however, was not appreciated. Search for the reasons why persons without tooth decay have no acid-forming bacteria in their mouths and why their salivas do not rapidly convert sugar into acid led the Illinois group to discovery of the role of ammonia.

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GENERAL SCIENCE

Science Talent Institute

Forty boy and girl winners in the Fourth Annual Science Talent Search, during honor-trip to Washington, are addressed by leading scientists.

See Front Cover

► THE YEAR'S talented young scientists of America attended the five-day Science Talent Institute in Washington (March 2-6) as the culminating event of the Fourth Annual Science Talent Search for the Westinghouse science scholarships. This educational event is conducted by the Science Clubs of America, administered by Science Service.

This issue of SCIENCE NEWS LETTER reports some of the highlights of the sessions. The next issue will continue this report.

The picture on the front cover of this SCIENCE NEWS LETTER shows Dr. S. G. Hibben and a group of the winners after his talk on "Lighting Tomorrow," given before the Science Talent Institute.

Rear Admiral J. A. Furer, Coordinator of Research and Development, United States Navy:

The war has not only brought science in civil life and the Armed Services together, but it has stimulated research to such a degree as to bring about speedy solutions to many important military and naval problems. It is this cooperative effort in research, plus speed, that has kept us ahead of the enemy in this complex technological war.

Scientists have invented new devices which make it possible for seamen to find their way on the ocean and to exact spots on distant shores under any condition of the weather. They are no longer dependent on celestial navigation, on lighthouses and on other aids to navigation in doing this. Range finding is no longer dependent on clear weather and optical instruments and gunnery has been so improved that ships at sea can demolish enemy gun implacements on shore with the greatest precision. Rockets now make it possible to fire a great volume of high explosives on to the beaches from small boats, because the rocket has no recoil and does not require foundations like a cannon. But most important of all, the scientists and engineers joined forces in developing the means for getting large numbers of men and great quantities of material of all kinds on to the beaches in an incredibly short space of time as compared to what was formerly possible.

Vessels for many purposes and various sizes all the way from 35-foot boats to 300-foot ships were specially designed and built to be run up on the beach. The idea of deliberately running ships up on the beach and discharging their cargoes from a huge port in the bow was a new one.

The great improvement made by scientists and engineers in the last ten years in the internal combustion engine for marine use has really made these special ships possible. Perhaps of even greater importance has been the development of amphibious vehicles such as the Alligator and the Duck. These seagoing trucks can take a load of men or materials from a ship ten miles out at sea, across coral reefs, through the surf, up on the beach and right on for miles inland to the unloading point.

The magnitude and speed of these operations are well illustrated by the assault on Saipan in which more than four regiments were put ashore on a single beach from over 700 amphibious vehicles in a matter of a few minutes, and within less than an hour tanks were being landed to support these men.

The scientists are doing a magnificent job. Without them the United Nations could not win this war. However, too many of these technically trained men are being put in uniform and assigned to duties that can be performed just as well by less talented men.

The core of the difficulty is that we have no adequate National Service Law. If we had had early in the war a true National Service Act it would then have been possible to keep the scientists at work on jobs that only they are qualified to do. Competent scientists are so few in number compared to the total population of the country that it is especially important that they be conserved for research work.

There were, for example, as of October 1, 1944, only about 4,500 physicists below the age of thirty in the United States. Some of these men are in the armed forces and some are not. Very important research projects are right now slowed down and some have not been taken up at all because scientists and engineers in this age group have gone into the Services who should have remained in laboratories and in industry.

A true National Service Act would have made it possible to provide an opportunity for the four or five thousand boys with particularly outstanding aptitudes for science who reach the age of eighteen each year to continue their education. By providing for the education of this comparatively small number of talented youths, we would be doing much to insure our position in the scientific world ten years from now, otherwise we will be faced with a very serious shortage of scientists when that time comes.

Maj. Gen. James C. Magee, U. S. A., Ret., former Surgeon General:

The increase in our knowledge relating to the causes, the prevention and the treatment of diseases represents a notable triumph for medical research. The impetus given scientific investigation by the impact of war has served to focus thought particularly on problems of a military medical nature and to present them in sharp relief to our attention. This is as it should be, for the complete support of our fighting forces takes precedence over all other considerations.

The mobilization of scientific talent devoted to medical research in the past few years has been productive of enormous benefits to the military establishments and to mankind at large. It does not matter whether a specific bit of research had its genesis in a purely military demand or whether it had its origin in other sources; the results of the research are open to all. A very great degree of the success attained may fairly be ascribed to the policy which permitted the concentration of so much investigative effort in the Office of Scientific Research and Development and the Committees of the Division of Medical Sciences of the National Research Council. So successful has this policy been the government has wisely determined to carry the same activities into peacetime and an *ad interim* committee for research has been appointed to function until the establishment of a permanent body has been accomplished. We may hope with

great confidence that some of the many unsolved problems in medicine that still confront us may be attacked with the same vigor and concentration of talent as were applied to wartime matter and that answers to some of those problems, at least, may be found.

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ENGINEERING

Uses Either Gas or Oil

Conversion from one fuel to another is made almost instantly in the new diesel engine which needs no electric sparking device.

➤ A NEW development in the diesel engine field permits the use of either gas or oil as fuel without any electric sparking device, saves from 20% to 25% in fuel consumption, and enables the change from one fuel to another without the necessity of a shut-down. It is a development of the Cooper-Bessemer Corporation.

Any engine built as a diesel can be fitted to operate on gas, but engines built purely as spark-ignited gas engines cannot be converted to work on the principle of the diesel. Conversion of diesels from one type of fuel to another has been possible in the past, but it has always been necessary to shut down and exchange major or minor parts. With the new development conversion is as simple as closing one valve and opening another, and it can be arranged so that the engine automatically goes from one to the other as the gas availability changes.

Seventeen years ago the company built a single-cylinder test engine on the diesel cycle to operate on gas. It used compressed air with the gas injected on top dead center under very high pressure. It was found that while it was possible to run such an engine without other ignition means, the engine performed very much better if pilot oil injection was also used. This engine was not marketed.

No thought was given at that time to the possibility of allowing the gas to go in with the intake air, because of the assumption that it would pre-ignite. It is now found possible to admit the gas with the engine air intake and be free of any evidence of premature ignition. In fact, an engineer of the company states, on very heavy overloads with natural gas, the mixture will not fire without the pilot oil.

"Assuming a diesel oil engine in operation and on load," Ralph L. Boyer, Cooper-Bessemer Corp. engineer, says, "if gas is admitted in the intake air the governor obviously will immediately reduce the amount of oil to compensate for the percentage being carried in the gas. It then merely becomes necessary to reduce the fuel oil injection to the desired minimum and then govern the percentage of gas according to load."

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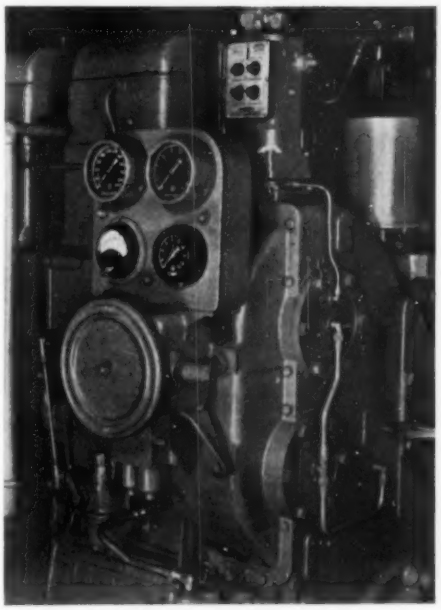

CONTROL END—This is the Cooper-Bessemer Type JS-8 Diesel engine, showing the gas-oil operating mechanism. This engine is rated 675 horsepower at 400 revolutions per minute.

HORTICULTURE

Home Grown Food

➤ HELPING to win the war isn't the only reason for having a Victory garden this year. You can save yourself money, too. By supplying your family with fresh vegetables for a whole season at little cost from even a small garden, you can grow the same vegetables that you would have to pay up to $50 or more for on the market. Home grown food is tastier, too. Vegetables and fruits do have a better flavor when they are garden fresh, as they are when they come out of your own Victory garden.

Science will be the Victory gardener's unseen helper this year, more than ever before, to help produce more and better vegetables. Science can be brought into your Victory garden from the moment you begin to plant your crops, reports Dr. P. V. Cardon, in charge of the Agricultural Research Administration of the U. S. Department of Agriculture.

"When you select the vegetables to plant in your garden you are applying at least two lines of scientific research. Scientists who breed better varieties of plants, and investigators who study nutritional needs may not seem to have much in common at first glance. Yet you are relying on recommendations made by both these groups when you choose your garden crops," Dr. Cardon pointed out, speaking as the guest of Watson Davis, director of Science Service, on the CBS broadcast of "Adventures in Science."

Plant scientists can offer you specific varieties of vegetables that have been created by plant breeders for better quality, higher yields, resistance to disease, and for other virtues of good garden crops, he stated.

Thanks to fertilizer technologists, Victory gardeners will have all the fertilizer they need, Dr. Cardon announced. Last year a new form of fertilizer nitrogen, granular ammonium nitrate, made up about a fifth of the nation's total nitrogen supply. We had ammonium nitrate before, but it attracted moisture so readily that it caked, sometimes even turned to liquid. Fertilizer scientists studied this problem and found a way to produce ammonium nitrate in very small pellets with a coating to protect them from moisture.

"Plan your garden for a long season," Dr. Cardon urged, "so that something fresh will be available from early in the spring until late in the fall. Home canning and storing plans should be included in garden plans. Vegetables you grow and can or store yourself don't cost you ration points. If you have any gardening problems, get in touch with your local Victory garden chairman or county agent. Planning your garden ahead will give you the most returns for your effort."

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ELECTRONICS

"Scanner" Peers Through Steel in New Invention

➤ ELECTRON streams or gamma rays are used in the apparatus on which patent 2,370,163 was granted to Donald G. C. Hare of Roslyn, N. Y. It is intended to replace costly, high-powered X-ray tubes and slow-operating radium photography, now used in searching thick steel plates for hidden flaws.

Essentially, the device is very simple. A source of penetrating radiation is placed on one side of the steel plate, and a detector of such radiations on the other. Rays passing through the plate will have their intensity changed by blow-holes or other defects in the metal, and the changes will be recorded by means of appropriate amplification and electrical or photographic apparatus. The ray source and its faithful recording companion are moved back and forth, either on the opposite ends of a U-shaped yoke or on parallel tracks by means of synchronized motors, thus "scanning" every inch of the plate.

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AERONAUTICS-MEDICINE

Flying Ambulances Have Web Straps for Litters

➤ CARGO-CARRYING planes can be rapidly converted into flying ambulances through the installation of web straps from which to suspend litters. The new web strap suspension system takes the place of rigid metal framework that formerly hampered loading operations and presented a definite hazard to medical personnel moving about the plane in flight. Straps are more economical in weight and space.

Originally designed for use on the C-82 Packet cargo plane by Michael Cozzoli, project engineer of the Fairchild Engine and Airplane Corporation in cooperation with the Air Technical Service Command, Wright Field, the new method of litter suspension is now standard equipment in all large military ambulance planes, including the C-46 Commando, C-47 Skytrain and C-54 Skymaster.

Using the strap method, 34 litters can be set up in the C-82. Each tier of litters is suspended from the ceiling and hooked to fittings in the floor. Loops in the web straps at regular intervals accommodate the litter handles. A clamp attachment tightens the loop around each handle.

All litters are held in place against the walls by brackets which are the same distance from the floor as the corresponding loops in the straps. The installation is permanent equipment with the airplane. When not in use the straps can be unhooked from the floor and rolled up into storage bags which are fastened to the ceiling. The equipment can be set up ready for use in less than two minutes.

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CHEMISTRY

Nylon Suit Protects Airmen in Frigid Waters

➤ AIRMEN dunked in near-freezing arctic waters in sub-zero weather after ditching their planes at sea may owe their lives to a new all-nylon anti-exposure suit that is coated with a substance to make it both water-tight and air-tight. Information regarding the substance itself was not revealed.

The protective cloth of the suit covers everything but the face. It was developed by the Personal Equipment Laboratory at the Air Technical Service Command at Wright Field. Under ordinary conditions an airman's survival in water 15 degrees above zero is a matter of minutes. It is reported to be one of the worst situations that a man can face.

During tests, airmen wearing the suit have spent an hour in water at very low temperatures. By use of thermocouples, scientists observed that at no time was any part of their bodies more than a few degrees below normal. The men themselves reported experiencing no real discomfort from cold.

Science News Letter, March 10, 1945

ORDNANCE

Tracer Elements Fixed on Separate Wad in Shotgun

➤ BODING ILL only to night-flying geese (or possibly also to night prowlers around chicken-coops) is a shotgun shell equipped with a number of luminous tracer pellets, the invention of Newland Knight of Mobile, Ala., patent 2,368,029. It differs from tracer shotgun ammunition heretofore proposed in having its tracer elements fixed on a separate wad that may be affixed to the front of an ordinary shotgun shell, instead of having them mixed with the main charge. The new method gives the user his choice of using tracer ammunition or not, without having to carry special shells.

Science News Letter, March 10, 1945

IN SCIEN

BIOCHEMISTRY

Penicillium Notatum Is Good Source of Vitamn D_2

➤ THE SAME MOLD, *Penicillium notatum*, that yields penicillin can be made a good source of rickets-preventing vitamin D_2 by irradiating it with ultraviolet light. Getting double value out of it in this way may help cut the cost of penicillin, it is suggested by three Swedish scientists, Dr. Ragnar Nilsson, Dr. Nils Olsson and Dr. Per Eric Nilsson, all of the Swedish Agricultural College at Uppsala.

The suggestion is made in a newly published memorial volume celebrating the sixtieth birthday of the eminent Swedish physicist, Dr. Thé Svedberg of the University of Uppsala. Copies of the book have just recently been received in this country.

Science News Letter, March 10, 1945

ASTRONOMY

White Dwarfs May Be Pulsating Stars

➤ WHITE dwarfs may be pulsating stars like the giant Cepheids, Dr. P. L. Bhatnagar of the University of Delhi reports in the British scientific journal, *Nature*. Although the pulsation may be too rapid to be observed directly, it may still exist in these exceptional stars which are of high temperature but still with an average density so great as to be almost incredible—sometimes millions of times that of water. The period of the pulsation would probably be less than ten seconds.

There seems to be no theoretical reason why the rhythmic expansion and contraction of a star, so far observed only in giant and super-giant stars, should not take place in denser stars and even in white dwarfs where the atoms have been stripped of their electrons, Dr. Bhatnagar states.

After a white dwarf has been created by the sudden collapse of a star, it is quite natural that the star should be left pulsating, the Delhi astronomer believes. Even if the physical conditions do not favor maintaining such action of the star, Dr. Bhatnagar estimates, once started the pulsation might last for about 1,000 years before it dies out.

Science News Letter, March 10, 1945

NE FIELDS

HORTICULTURE

New Lettuce Variety Is Promised for 1946

➤ A NEW lettuce variety, valuable for summer use because it does not shoot up a flowering stalk and "go to seed" as soon as warm weather comes, is announced by the U. S. Department of Agriculture. Propagation stocks of seed are now being distributed to growers, and it is expected that enough seed for general planting will be available by the spring of 1946.

The new lettuce was developed by Dr. Ross C. Thompson at the Plant Industry Station at Beltsville, Md., a short distance outside of Washington. It has frilled, light green leaves with the very wrinkled surface known to horticulturists as "savoyed."

Gardeners refer to the "going-to-seed" process in lettuce as bolting. Because of its reluctance to do this, the new variety has been named "Slobolt."

Science News Letter, March 10, 1945

GEOGRAPHY

Australia's Future Meat Supply Is Endangered

➤ MEAT from Australia, now available in generous quantities to our troops in the wide Pacific war areas, through reverse lend-lease, faces an uncertain future because of declining yields of water from the artesian wells on which the country's entire pastoral industry depends; declares James E. Collier, University of Missouri geographer.

All of interior and western Australia is dry country, with annual rainfall of 20 inches or less. It is therefore incapable of development for high-yield agricultural purposes, and is best adapted for grazing cattle and sheep. Water for the livestock, both on the range and along routes over which the animals are driven to market, is supplied mainly from deep wells.

These artesian wells are failing. For a good many years, water has been taken out of the great underground reservoirs faster than new supplies have been trickling in. Many wells that used to be free-flowing have passed over into the sub-artesian category, requiring pumping.

Total number of artesian wells in Australia was about 8,765 at last counting, as compared with approximately 2,200 in 1900, but the total present flow of water is estimated at only 340,544,000 gallons a day as compared with 673,752,000 gallons a day at the turn of the century. That is, despite a quadrupling in number of wells, the yield has fallen off to about half what it was 45 years ago.

Some artesian water sources remain untapped, Mr. Collier states, especially in the interior and western basins of Australia. However, the likeliest way to increase available water, in his estimation, is to conserve present supplies. Most of the water is now carried away from the wells in open earthen ditches, and this involves prodigious waste through seepage into the ground and evaporation into the always-thirsty desert air. Water-conserving installations may be expected to cost money, but with water constantly growing scarcer and more valuable the expenditures begin to appear economically justifiable.

Mr. Collier's facts and conclusions are presented in a report to the *Scientific Monthly*. (Feb.)

Science News Letter, March 10, 1945

CHEMISTRY

Simple Chemical Test Determines Butter Quality

➤ A SIMPLE chemical test has been developed to determine the quality of butter, to replace the ordinarily used method that depends on the human senses of taste and smell. A chemically pure fat solvent, saturated with a neutral red color, is used. Melted butter put in it brings out the red; the more rancid the butter, the stronger the color. The development is the result of work at the Cornell University Agricultural Experiment Station.

The chemical used is pure xylol. In the test, one cubic centimeter of milk-fat is melted in the xylol, which has been saturated with the neutral red color, and the resulting product compared with the different shades of red in a standards series. These standards contain known quantities of oleic acid, one of the acids commonly measured in butter. A strong red color after the processing indicates a strong rancid butter. The lighter the shade of red, the less the rancidity.

The new method may be used by creameries and butter dealers with only the simplest training. It may possibly be usable also in grading cream. It was discovered in 1942 by Prof. George Knaysi, bacteriologist, while working on types of fats in the cells of bacteria, and later applied successfully to butter by him.

Science News Letter, March 10, 1945

SOCIOLOGY

Expectation of Life Is Index to Social Progress

➤ THE LENGTH of life to be expected by a newborn baby, which has increased from 41 years in 1840 to about 62 years in 1930, has kept pace with scientific advancement during those years and is an index of social progress, Dr. Hornell Hart and Hilda Hertz of Duke University report in the *American Sociological Review*.

"High expectation rates," they say, "reflect good working conditions, long life, relative freedom from bereavement, health, high scales of living, efficient government, and effective education. Low expectation rates reflect early death, widespread bereavement, prevalence of disease, poverty, filth, vermin, political corruption or inefficiency, and ignorance."

The expectation of life in cities has increased much more sharply than life expectation in rural regions, it is pointed out. The progress has been going on for the past 400 years. Expectation of life has increased as much since 1800 as it did during the entire preceding 50,000 years, the scientists conclude.

Although present trends would indicate that no infant in the future could rely on living to more than from 70 to 75 years, they believe, there is no reason, they feel, why new discoveries such as a cure for cancer or the reasons for aging should not bring new and even more sweeping upsurges in life expectancy.

Science News Letter, March 10, 1945

ENGINEERING

Lamme Medal Awarded Soren H. Mortensen

➤ THE LAMME medal of the American Institute of Electrical Engineers has been awarded to Soren H. Mortensen, chief electrical engineer of the Allis-Chalmers Manufacturing Company, for his pioneer work in the development of self-starting synchronous motors and for his contributions to the development of large hydraulic and steam turbine driven generators.

Mr. Mortensen, a native of Denmark, was educated in that country and in Germany and came to America in 1903 for employment by the Westinghouse Electric & Manufacturing Company, and later by the Allis-Chalmers firm. He became chief electrical engineer of the latter company in 1942.

Science News Letter, March 10, 1945

METEOROLOGY

Conquering the Weather

Bomber's moons, thunderstorms, fog and ice are our allies as well as our enemies, ruthless as gunfire and often harder to out-maneuver than enemy pilots.

By ROBERT N. FARR

➤ BOMBER'S moons, thunderstorms, fog and ice aren't things that just "happen." They are part of a definite, predictable pattern of weather all over the world. They are our allies, and our enemies as well, ruthless as gunfire and often harder to out-maneuver than an enemy pilot.

Weather plays an important part in any war. The evacuation of Dunkirk was successful because fog was on the side of the Allies during a time when the Luftwaffe was trying to break it up. When the Japs raided Pearl Harbor, they rolled in behind a combination of rain, lightning and intense icing conditions that obscured their movements and contributed to their initial success. The Nazis used a blanket of bad weather last December to hide the movement of their troops as they prepared to push back Allied forces in Europe.

Many a strategic air and ground operation has been intentionally timed to conform with weather favorable to the tactical situation. The raid on the Gilbert and Marshall Islands was so planned that our planes left their carriers, made the raid and returned to their flat-tops under favorable flying conditions. The last plane had hardly been caught on the deck of its carrier before bad weather, which had been anticipated, set in and protected the carrier fleet from aerial reprisals until it was safely out of the combat zone.

Important Weapon

To our military leaders weather is as important a tactical weapon in war as an armada of bombing planes or a battery of fast-moving tanks. From Eisenhower, MacArthur, Patton, King and Nimitz straight down the line, our military and naval leaders know what weather is, what causes it and what influences it. Aerology, the science of meteorology applied to the upper air, is essential knowledge as long as men fly or fight.

Aerology is a difficult science because it is impossible to produce weather phenomena in a laboratory, even on a small scale. World War I was a proving ground for many new aerological theories, one of the most important of which is the polar front method of weather map analysis, used to advantage every day where Americans are in action.

The atmosphere is like an envelope of gas extending nearly 200 miles above the surface of the earth. Through it move deep masses of air, like the currents in an ocean. Our lives depend upon this gas, because it contains the air we breathe. Flight also depends upon it, for it is the action of the wings of the airplane within this envelope of air that provides life which makes flying possible.

The atmosphere is composed of about 99 per cent oxygen and nitrogen, the rest being made up of minor gases, one of which is water vapor. All factors that make up weather, including clouds, rain, snow and ice, occur in the segment of the atmosphere nearest to the earth.

In the zone of weather there is a general flow of air over the earth's surface which follows a definite and fixed pattern. Cold air masses travel from the polar regions. Upon being warmed up by contact with the surface of the earth, the air develops vertical currents, which give a pilot a bumpy ride in rough air. Warm air masses spread out from the area around the equator. A pilot flying in a warm air mass will encounter stable air.

When warm air and cold air meet, they do not mix readily. Each air mass tends to remain intact, with the cold air sliding beneath the warm air, or the warm air advancing over the cold. Warm air never crowds out cold, because of their relative densities, but it may replace cold air as the cold mass moves out. The sky becomes a battleground as clouds are formed which often result in rain or snow.

Warm air rises around the equator and cold air sinks at the poles, so that a "polar cap," an accumulation of a mass of cold air, builds up in the polar regions of the earth. When the pressure of this mass of air becomes great enough, the polar front is pushed down and begins to travel south. The leading edge of this polar front is a cold front, a boundary line between the cold and warm temperatures. This cold front is a weather factory which makes all kinds of weather and is very dangerous, although the

DIFFICULT FLYING—Clouds, clinging to air pockets between snow-capped mountains, make it hard for pilots to see the valleys below.

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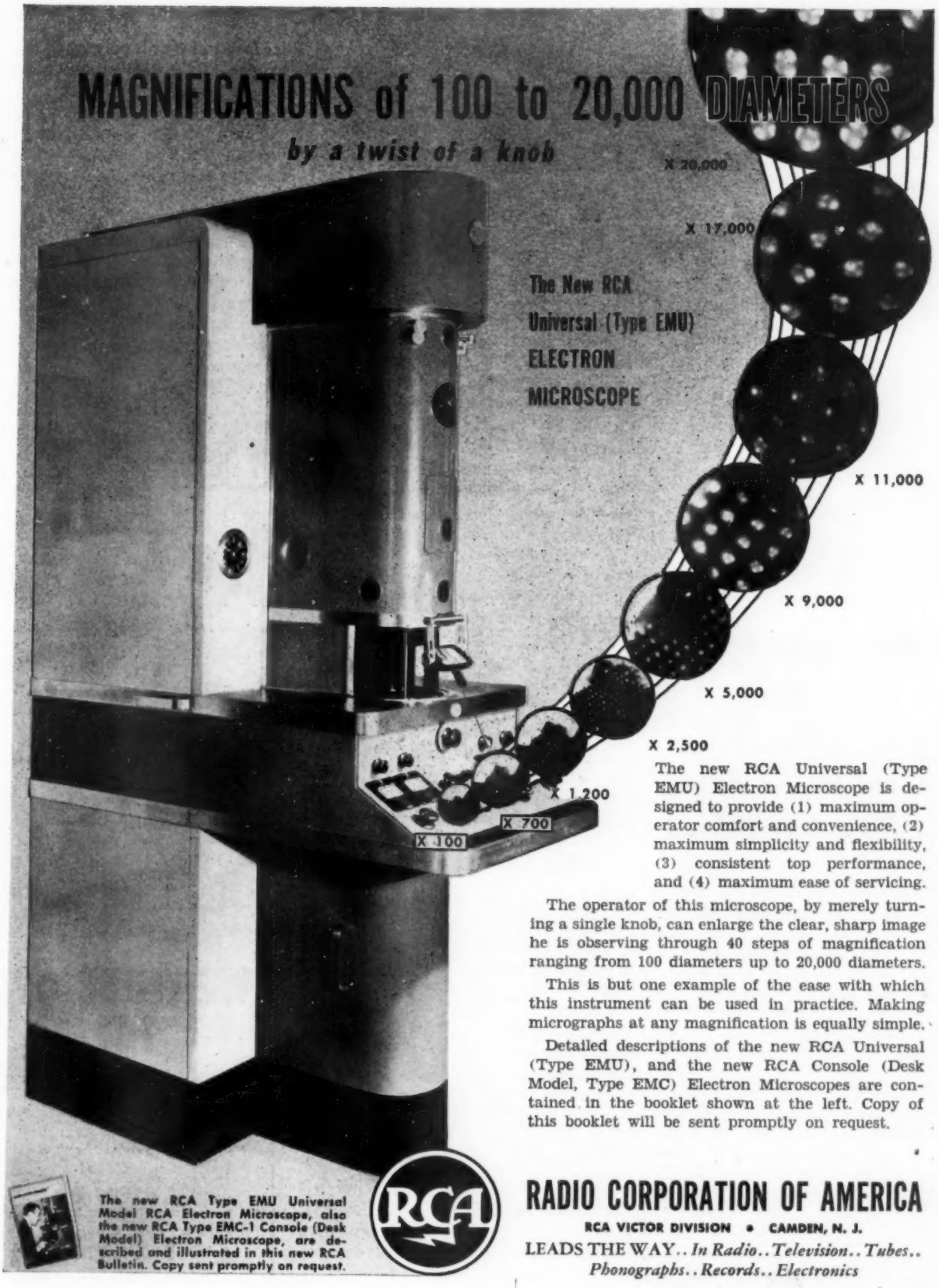

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Do You Know?

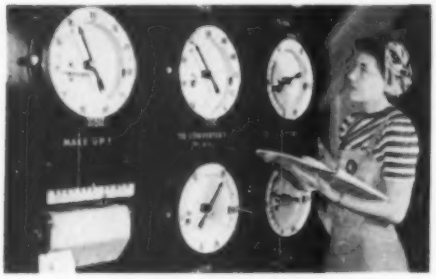
Sulfanilamide fed to laying hens resulted in many eggs without shells; sulfapyridine had no similar effect.

Sweden plans a new *airfield*, located near Stockholm, for transatlantic traffic; it will have four runways each two miles long.

Shrimp, as taken from the water, look like small lobsters, but unlike lobsters have edible meat only in tail and abdomen; their tiny claws hold too little to be worth recovering.

The earliest *tin* object yet known was found on Lesbos island off the northwestern corner of Asia Minor at the entrance to the Dardanelles; it is a bangle of pure tin probably 4,500 years old.

Bagasse, or what is left of sugar cane when the juice is extracted, can be used for fuel, building and insulation material, raw material for alpha-cellulose, plastics, decolorizing char and other industrial purposes.



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From Page 154

warm front presents many tough operating problems such as poor visibility, low clouds, freezing rains, over a large area.

The safest place for an aviator in a cold front area is at home reading a good book. But frequently a war mission calls for flying in a cold front area. Pilots in the Aleutian Islands sometimes pass through half a dozen cold fronts on their way out in a day's patrol, and pass through them again on their return to their base.

Storms scattered along the entire cold front, sometimes 2,000 miles long, are the meanest kind. A cold front is much longer than it is wide. It may be 50 to 100 miles wide. The trick of flying a cold front, therefore, is not to fly the long way, parallel to the front, but straight through it. Pilots say that if you are flying in a cold front more than 30 minutes, you are flying it the wrong way, since even in a low-powered plane you can cover about 50 miles in that time. The best way to recognize the presence of a cold front is to note when winds become gusty, the barometer jumpy and the temperature dropping with a bank of threatening clouds appearing on the horizon.

Cold fronts are most intense in the late fall, winter and spring, because at these seasons there are the sharpest contrasts in temperature between the masses of cold and warm air. The three principal dangers of flying through a cold front are visibility, turbulence (which may be violent enough to shake a plane out of the pilot's control and frequently is accompanied by a thunderstorm) and icing.

In the air, a thunderstorm looks like a head of cauliflower with an anvil on top of it. It is the color of dirty cotton. Some thunderstorms are 30,000 to 60,000 feet high, a towering mass of clouds containing ice mixed with rain, and sometimes hail. Lightning flashes, issuing from the most violent part of the storm, are a frequent first warning to pilots.

The anvil top, above the turbulent activity of the storm, is made up primarily of ice crystals. Hailstones, ranging in size from a pea to a baseball, form in the "chimney" of the thunderstorm. Experience has taught pilots that the best thing to do is to fly around a thunderstorm. If conditions prevent this, the next best thing to do is to fly above or below it. Finally, as a last resort, they fly through it.

Ice ordinarily exists in the air in cloud formations. The best rule for pilots is to stay out of clouds. The danger signal is the first trace of ice on the windshield. Ice forms in the air only when two things happen at the same time: when moisture is present in liquid form, and when the temperature is at freezing or below.

There are two kinds of ice that may form on a plane and they are more deadly than a Zero or a Messerschmitt. One is clear ice, the kind that forms in the trays of your refrigerator. It is hard, glass-like, and difficult to break loose. The other is rime ice, the kind that forms on refrigerator coils. It is white, granular and can be flaked off. Nonturbulent clouds contain rime ice, or small ice crystals. Turbulent clouds contain clear ice made from droplets of water. Clear ice forms more quickly and sticks more tightly than rime ice. Usually a combination of the two are encountered in flight. (*Turn to page 158*)

Facts ABOUT

WEATHER OVER TOKIO

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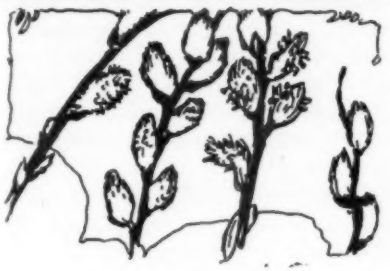
BIOLOGY

NATURE RAMBLINGS

by Frank Thone



You and Phenology

▶ IF YOU have ever taken note of the date on which the first robin appeared in your neighborhood, or the first pussy-willows or skunk-cabbages appeared, you have been a phenologist.

Phenology is one of the most fascinating of the open-air sciences. It consists essentially in the systematic observation of the dates on which things happen: the first robin, the first violet, the first oak leaves, the first mosquito. It can go on all season: the first corn tassel, the first goldenrod, the first wild aster. As the year grows older, last things become worth noting: the last gentian, the last flight of wild ducks, the last housefly.

The word phenology comes from a Greek root meaning to disclose, to make visible or manifest. It is related to the common word, phenomenon, and to the post-Christmas feast of the Epiphany. (Incidentally, watch typists and printers who meet the word for the first time, lest they slip in a falsifying "r": phenology has no more to do with phrenology than entomology has to do with etymology.)

Phenology is a practically useful science as well as a fascinating hobby. Its pragmatic value is well demonstrated by its antiquity. Farmers' and woodsmen's lore is largely rough-and-ready phenology; Virgil's *Georgics* is an early textbook on the subject. The Bible is full of phenology, especially the New Testament parables: "Now learn a parable of the fig tree: When his branch is yet tender, and putteth forth leaves, ye know that summer is nigh."

Your own phenological notebook can be as full or as simple as suits your own convenience. The important thing is to make it a year-to-year undertaking. Down one side list all the birds, flowers, trees and so on that you intend to watch, for first appearance, first nest, first eggs, first fledglings, first flowers, first leaves, first fruits, first signs of ripening, etc. Rule columns for each year, from 1945 until you are so old your eyes won't serve you any more, or your legs carry you afield.

An especially worth-while kind of phenological observations are those that are made on the same individual organism, if it is one that stays put. Trees are especially well suited to this kind of check-up, being both long-lived and firmly anchored. If you have a favorite elm or maple in your front yard, a pet apple or cherry tree on your lot, a familiar dogwood or hickory in the woods, it will become a better, more intimate neighbor than ever if you make a habit of asking it from time to time, "How are you feeling this spring? How did you come through the winter? Are all the little apples growing nicely?"

There can be a lot of fun in phenology.

Science News Letter, March 10, 1945

Tin and lead were definitely shown by the monk, Basil Valentine, to be distinct metals in 1450 A. D.

In the Genesis of the Rheumatic State

nutritional inadequacy of the diet appears to play an important role. Though multiple deficiency may be more conducive than deficiency of a single factor, insufficient protein intake apparently engenders increased susceptibility.* Thus an adequate amount of meat, with its high content of biologically optimal protein, gains added importance in the dietary of children.

*In a study of children and adolescents, undertaken to determine if nutrition exerts a conditioning influence in the genesis of rheumatic fever, Coburn and Moore conclude: "This indicates that the association between greater susceptibility and a deficient intake of protein is statistically significant . . . That a lack of those proteins most useful in growth and repair may be important in conditioning a subject to rheumatism is compatible with all observations made during this study." COBURN, A. F., and MOORE, L. V.: Nutrition as a Conditioning Factor in the Rheumatic State, Am. J. Dis. Child. 65:744 (May) 1943.

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PHYSICS

Shortage of Physicists

➤ A 12-YEAR shortage of the most essential scientists for war and industrial research as the consequence of the non-technical use of scientists and science students in the fighting forces is forecast by Dr. Gaylord P. Harnwell of the University of Pennsylvania, writing as editor of the *Review of Science Instruments* journal.

In this war with radar, airplanes, and other such devices, the nation's technical superiority is due to research in the field of physics, Dr. Harnwell points out, although chemistry played the chief role in the first World War. Figures show, however, that the number of physicists in training in this country has dwindled alarmingly.

The number of physicists who were granted the doctor's degree has dropped markedly in the war years, with only 55 in 1944 compared with a peak of 191 in 1941. Dr. Harnwell takes 26 as the average age at which a doctor's degree is received, 1941 as the last year in which a normal number of degrees were awarded, and finds that even with a revival of training of 18-year-old students in 1945 there will be a gap of 12 years during which very few physicists will be available.

The nation will be short 1800 graduate physicists in 1953, compared with present 2833 Ph.D. physicists listed in the National Roster of Scientific and Specialized Personnel. The situation is made worse by the demand expected for physicists to conduct researches for industry in the postwar era.

Unlike colleges in the United States, British and Soviet technical schools have been allowed to keep up their enrollments as a war and postwar measure. An authoritative British report states that their output of engineers and physicists has more than doubled during the war.

Because many professors have been drawn away from the colleges for war research, the problem now and in the immediate future is not merely a matter of getting students into the colleges, but of reorganizing the teaching staffs to teach them.

Science News Letter, March 10, 1945

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From Page 156

Ice forms on the leading edges of the wing, propeller blades, on the radio antennae, on the windshield and on the air-speed indicator as well as in the carburetor of the engine. If ice forms at any of these points it will affect the flying performance of the plane, and in some cases render it unfit for flight. Today aircraft are equipped with mechanical devices such as rubber boot de-icers for the wings, de-icing fluid for propellers and windshield, and heaters for the air speed indicator. In the final analysis, however, the knowledge and judgment of the pilot are the greatest factors in determining whether he will beat the ice or crash.

The most dangerous of all icing conditions is caused by freezing rain. We are all familiar with ice storms on the eastern seaboard when tree branches break and power lines snap under the sheer weight of ice that adheres to them. A plane can ice-up just as heavily, and naturally it won't withstand the ice load. In a freezing rain the trick of outsmarting this dangerous adversary is to go up higher, where warmer temperatures protect the plane from icing.

Military flyers taught to be weather experts know how to avoid these bad weather flying conditions and at the same time how to accomplish their missions in spite of them. Weather service bases are located in the far corners of the world, in the arctic and tropics where weather is born. Reports from these stations are transmitted to Washington D. C., where military weather maps are drawn and sent to our armed forces all over the world.

Weather servicing units accompany every military force, to provide on-the-spot short-range forecasts on which commanders base their tactical operations. Often these weather stations are mounted on vehicles. At Salerno a jeep fitted with weather observing equipment was one of the first units to land. Airplanes, fitted as weather laboratories, fly long distances to gather weather data before military or aerial operations are undertaken.

The uncanny ability that these weather men in our armed forces possess is illustrated by an attack on Wewak, New Guinea. Our planes were based at Port Moresby. Between the base and the target lies the towering Owen Stanley Range of mountains, usually crowned by 40,000 foot thunderstorms which blocked the way for our attack. The commanding general ordered the weathermen to predict a cloudless, stormless day. About 24 hours in advance of proper conditions, the weathermen issued a favorable forecast. Our attack, timed precisely to the forecast, enabled us to bag, at one time, 309 Jap planes without losing a single one of our own planes to our other enemy, bad weather.

Science News Letter, March 10, 1945

The stinging nettle, a weed, is a potential source of commercial *chlorophyll*.

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• Books of the Week •

▶ THE READING public now familiar with the word electronics but uncertain in regard to its real meaning can obtain enlightening information from AN INTRODUCTION TO ELECTRONICS, by Ralph G. Hudson, written for laymen with only an elementary knowledge of electricity, physics and mathematics. It explains what is included in electronics and the part this new science is playing in the research and industrial world. (*Macmillan*, $3.)

Science News Letter, March 10, 1945

▶ APPRAISAL of the effects of war on higher education in this country is the purpose of THE ROLE OF HIGHER EDUCATION IN WAR AND AFTER by J. Hillis Miller and Dorothy V. N. Brooks (*Harper*, $2.50). Wartime measures such as selective training, war-enforced withdrawals of faculty, accelerated war time curricula, state and government aid programs, etc., are discussed at length. Several chapters are devoted to the new education the boys will find when they come marching home. The influences that promise to predominate in the reconversion of American colleges and universities to peace-time conditions are summarized in the light of nation-wide trends.

Science News Letter, March 10, 1945

• Just Off the Press •

BACTERIOLOGY AND ALLIED SUBJECTS—Louis Gershenfeld—*Mack*, 561 p., illus., $6.

THE COMET OF 1577: ITS PLACE IN THE HISTORY OF ASTRONOMY—C. Doris Hellman—*Columbia Univ. Press*, 488 p., $6.

THE COMMON COLD AND HOW TO FIGHT IT—Noah D. Fabricant—*Ziff-Davis*, 107 p., illus., $1.50.

THE FIRE SERVICE TODAY—Frank Eyre and E. C. R. Hadfield—*Oxford*, 148 p., illus., $2.

THE MARCH OF MEDICINE—The New York Academy of Medicine Lectures to the Laity, 1944—*Columbia Univ. Press*, 121 p., $1.75.

THE QUEST FOR MORAL LAW—Louise Saxe Eby—*Columbia Univ. Press*, 289 p., $3.25.

TWO HUNDRED THOUSAND FLYERS, the Story of the Civilian-AAF Pilot Training Program—Willard Wiener—*Infantry Journal*, 196 p., illus., $2.75.

Science News Letter, March 10, 1945

The *stone-fly* after hatching breathes first by gills that extend from behind the legs.

Salamanders require moisture and therefore live around wet moss or in damp earth; lizards are found most often in dry, sandy places or on tree branches where they can bask in the sun.

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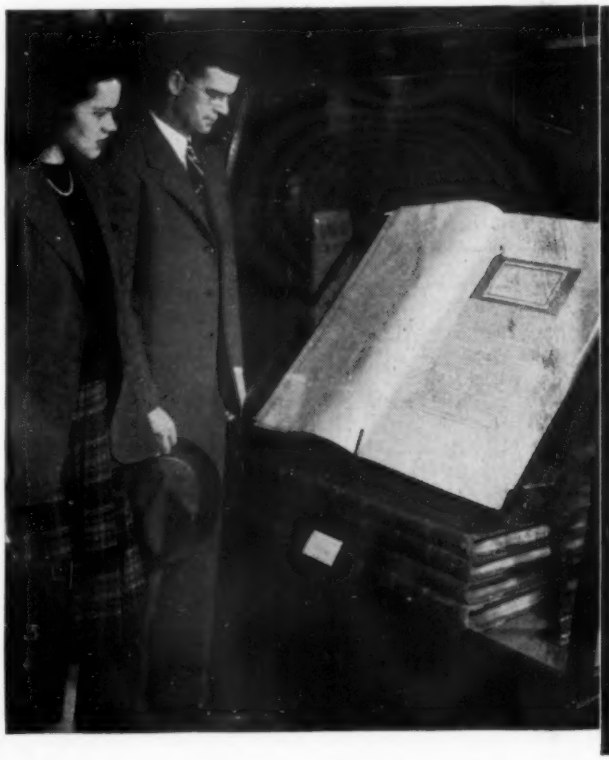

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Science News Letter, March 10, 1945

❁ *ASPHALTED BAGS, placed between the outer case and the packaged food in K rations for soldiers in tropical areas assures complete protection in torrential rains and continued high humidity. This triplex asphalt-impregnated bag is in addition to the regular coverings for other climates.*

Science News Letter, March 10, 1945

❁ *PICTURE SUPPORT, illuminated, consists of a frame holding two pieces of transparent plastic sheets between which the picture is placed, and a flashlight bulb in a case behind. The bulb operates on the automobile battery, and the illuminated picture is attached to the steering wheel.*

Science News Letter, March 10, 1945

❁ *NUT TURNING device, replacing the familiar wrench, rotates the nut by a series of rapid hammer blows on its corners. Two projecting jaws embrace the nut, and the rotary hammer, having spaced projections or heads, turns it by repeated impact. Power is supplied to the hammer through a flexible shaft.*

Science News Letter, March 10, 1945

❁ *WATERTIGHT match cases for soldiers are made of an olive-drab molded plastic with a screw top. It has a metal striker bar in the bottom. For safety matches, a striker is glued inside the top. The picture shows the pocket case with ribbed sides for easy holding.*

Science News Letter, March 10, 1945

❁ *BRUSHLESS shaving preparation in a dry stick, that may be applied to the wet face without any applicator but the stick itself, requires no massage by the fingers. It is largely sesame oil and spermaceti, mixed with small amounts of tallow soap, fatty acid esters, titanium oxide and perfume.*

Science News Letter, March 10, 1945

❁ *FOLDING bazookas, one-half the length of the ordinary bazooka when folded, were developed for paratroopers but are handy for soldiers in underbrush and jungle. They were first used in the Normandy invasion.*

Science News Letter, March 10, 1945

❁ *MEASURING device is an elongated barrel that fits over the end of a pencil, with a graduated wheel two inches in circumference at its end. In measuring, the wheel, rolled over the distance, turns a screw inside the barrel that moves an indicator along a scale on the outside.*

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 249.

Science News Letter, March 10, 1945

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